

AMENDMENTS TO THE CLAIMS

21. (Currently amended) A method of operating a telecommunications network in which the telecommunications network includes plural distinct nodes interconnected by plural distinct spans, each node having a ~~digital cross-connect switch~~ switching machine for making and breaking connections between links in adjacent spans forming span paths through the node, the method comprising the steps of:

(a1) selecting an originating node;

(a2) initiating an automatic search from the originating node to identify a set of successive intermediate nodes that, together with the originating node, may form a closed path having at least one spare link between each pair of adjacent nodes in the closed path; ~~and~~

b) forming a cross-connection at each node in the closed path to connect spare links in each of the adjacent spans lying in the closed path and thus form a span path through each node in the closed path;

in which searching for a set of successive intermediate nodes that may form a closed path comprises broadcasting statelets from successive nodes in the network along successive spans having at least one spare link in each span at least until a first statelet is broadcast to the originating node, in which the successive nodes are not capable of forming a closed path that does not include the originating node and each statelet is prevented from being broadcast along the span on which the statelet arrived at the intermediate node;

in which broadcasting statelets further comprises initiating a broadcast from an originating node by broadcasting an originating statelet and receiving incoming statelets at intermediate nodes, and broadcasting at least one statelet received by each intermediate node to one or more nodes adjacent to the intermediate node and connected to the intermediate node by

at least one spare link, only one statelet derived from the same originating statelet being broadcast, at any intermediate node, on any one span;

each statelet broadcast through the network being modified at each intermediate node to update a route field in the statelet that records the successive nodes by which the statelet has been broadcast; and

each statelet broadcast through the network being modified at each intermediate node to update a numPaths field in the statelet that records the number of paths available for restoration of telecommunications traffic along the successive nodes by which the statelet has been broadcast.

22.-24. (Canceled)

25. (Currently amended) The method of claim ~~[[24]]~~ 21 in which each statelet is broadcast to the maximum extent possible at each successive node.

26. (Canceled)

27. (Currently amended) The method of claim ~~[[26]]~~ 21 in which incoming statelets at an intermediate node are broadcast preferentially according to an ordering of the incoming statelets.

28. (Canceled)

29. (Currently amended) The method of claim ~~[[28]]~~ 21 in which a statelet broadcast through the network is modified at each intermediate node to update a hop count field in the statelet that records the number of spans traversed by the statelet.

30. (Original) The method of claim 29 in which incoming statelets at an intermediate node are broadcast preferentially according to an ordering of the incoming statelets based upon relative values of the numPaths and hop count fields of the incoming statelets.

31. (Currently amended) The method of claim ~~[[26]]~~ 21 in which a closed path is formed by making cross-connections between successive spans in one of several routes followed by incoming statelets received by an originating node.

32. (Original) The method of claim 31 in which the one of several routes is selected according to an ordering of fields in the incoming statelets.

33. (Original) The method of claim 32 in which the ordering is based upon a relationship between the number of paths available for restoration of telecommunications traffic along the successive nodes by which each incoming statelet has been broadcast and the number of spans traversed by the respective incoming statelets.

34. (Original) The method of claim 32 in which routes followed by incoming statelets are evaluated for a pre-determined period.

35. (Currently amended) The method of claim ~~[[24]]~~ 21 in which a closed path is formed by making cross-connections between successive spans in one of several routes followed by incoming statelets received by an originating node.

36. (Original) The method of claim 35 in which the one of several routes is selected according to an ordering of fields in the incoming statelets.

37. (Original) The method of claim 36 in which the ordering is based upon a relationship between the number of paths available for restoration of telecommunications traffic

along the successive nodes by which each incoming statelet has been broadcast and the number of spans traversed by the respective incoming statelets.

38. (Original) The method of claim 36 in which routes followed by incoming statelets are evaluated for a pre-determined period.

39. (Original) The method of claim 21 further comprising repeating steps a1, a2 and b for each of several originating nodes in the network.

40. (Original) The method of claim 21 further comprising periodically repeating steps a2 and b at a node.

41. (Original) The method of claim 40 in which the network has a configuration of working links, and repetition of steps a2 and b at a node is carried out after a change of the configuration of working links in the network.

42. (Original) The method of claim 41 in which the repetition of steps a2 and b at a node is carried out for each of several nodes in the network.

43.-45. (Canceled)

46. (New) A method of operating a telecommunications network in which the telecommunications network includes plural distinct nodes interconnected by plural distinct spans, each node having a switching machine for making and breaking connections between links in adjacent spans forming span paths through the node, the method comprising the steps of:

(a1) selecting an originating node;

(a2) initiating an automatic search from the originating node to identify a set of successive intermediate nodes that, together with the originating node, may form a closed path having at least one spare link between each pair of adjacent nodes in the closed path;

b) forming a cross-connection at each node in the closed path to connect spare links in each of the adjacent spans lying in the closed path and thus form a span path through each node in the closed path;

searching for a set of successive intermediate nodes that may form a closed path comprising broadcasting statelets from successive nodes in the network along successive spans having at least one spare link in each span at least until a first statelet is broadcast to the originating node, in which the successive nodes are not capable of forming a closed path that does not include the originating node and each statelet is prevented from being broadcast along the span on which the statelet arrived at the intermediate node;

broadcasting statelets further comprising initiating a broadcast from an originating node by broadcasting an originating statelet and receiving incoming statelets at intermediate nodes, and broadcasting at least one statelet received by each intermediate node to one or more nodes adjacent to the intermediate node and connected to the intermediate node by at least one spare link, only one statelet derived from the same originating statelet being broadcast, at any intermediate node, on any one span;

each statelet broadcast through the network being modified at each intermediate node to update a route field in the statelet that records the successive nodes by which the statelet has been broadcast; and

forming a closed path by making cross-connections between successive spans in one of several routes followed by incoming statelets received by an originating node, in which the one of several routes is selected according to an ordering of fields in the incoming statelets.

47. (New) A method of operating a telecommunications network in which the telecommunications network includes plural distinct nodes interconnected by plural distinct spans, each node having a switching machine for making and breaking connections between links in adjacent spans forming span paths through the node, the method comprising the steps of:

(a1) selecting an originating node;

(a2) initiating an automatic search from the originating node to identify a set of successive intermediate nodes that, together with the originating node, may form a closed path having at least one spare link between each pair of adjacent nodes in the closed path;

b) forming a cross-connection at each node in the closed path to connect spare links in each of the adjacent spans lying in the closed path and thus form a span path through each node in the closed path;

searching for a set of successive intermediate nodes that may form a closed path comprising broadcasting statelets from successive nodes in the network along successive spans having at least one spare link in each span at least until a first statelet is broadcast to the originating node, in which the successive nodes are not capable of forming a closed path that does not include the originating node and each statelet is prevented from being broadcast along the span on which the statelet arrived at the intermediate node;

broadcasting statelets further comprising initiating a broadcast from an originating node by broadcasting an originating statelet and receiving incoming statelets at intermediate nodes, and broadcasting at least one statelet received by each intermediate node to one or more nodes adjacent to the intermediate node and connected to the intermediate node by at least one spare link, only one statelet derived from the same originating statelet being broadcast, at any intermediate node, on any one span;

each statelet broadcast through the network being modified at each intermediate node to update a route field in the statelet that records the successive nodes by which the statelet has been broadcast; and

forming a closed path by making cross-connections between successive spans in one of several routes followed by incoming statelets received by an originating node, in which the one of several routes is selected according to an ordering of fields in the incoming statelets.

48. (New) A method of operating a telecommunications network in which the telecommunications network includes plural distinct nodes interconnected by plural distinct spans, each node having a switching machine for making and breaking connections between channels in adjacent spans, the method comprising:

connecting spare capacity in closed paths, each closed path extending through a set of nodes, in readiness for a span failure; and

configuring the telecommunications network to (A) restore working traffic affected by a span failure on a span that is part of a closed path by routing signals along surviving nodes of the closed path; and (B) restore working traffic affected by a span failure on a span between two nodes that are part of a closed path, and the span is not within the closed path, by routing signals along the closed path.